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Can Economic Moats Provide Investors With a Competitive Advantage?

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Abstract

This thesis examines the relationship between competitive advantage and stock performance. Using Morningstar's economic moat rating classifications, this paper contributes to the competitive advantage literature by providing an empirical assessment of whether wide moat stocks, or companies deemed to have sustainable competitive advantages, made for superior investments compared to non-wide moat stocks over a ten-year time-frame from 2008 to 2017. Additionally, this paper accounts for a previously under-studied topic within the economic moat literature by specifically analyzing three sectors and nine industries. The results indicate that wide moat stocks surprisingly may not make for a superior stock investment, as the wide moat observations in the selected sample were found to have a negative relationship with average annual returns (coefficient = -0.05) that was statistically significant at the 5% level. Companies with no economic moat, meanwhile, were found to have a positive relationship with average annual returns (coefficient = 0.02). Taken together, these results indicate that investment research firms such as Morningstar may place excessive weight on wide moat status and thus undervalue seemingly less attractive companies that have the potential to offer far higher returns.

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I. Introduction

What makes for a superior investment? According to famed investor and Berkshire Hathaway chairman Warren Buffett, one of the keys is to find companies with sustainable competitive advantages -- or, in his words, *wide economic moats*. In a 2007 letter to Berkshire Hathaway shareholders, for instance, Buffett had this to say regarding what he believes constitutes a successful company:

"A truly great business must have an enduring "moat" that protects excellent returns on invested capital. The dynamics of capitalism guarantee that competitors will repeatedly assault any business "castle" that is earning high returns. Therefore a formidable barrier such as a company being the low-cost producer (GEICO, Costco) or possessing a powerful world-wide brand (Coca-Cola, Gillette, American Express) is essential for sustained success."

Buffett's belief that companies with exploitable edges are successful at withstanding competition and, in turn, likely to consistently post strong profits is supported by others in academia, as the competitive advantage literature developed by authors such as Harvard professor Michael Porter in the early 1980's includes a number of articles that provide both theoretical and empirical support in favor of companies with sustainable competitive advantages. This is certainly not an astonishing claim, though. After all, it is apparent that a company with, say, unmatched cost advantages (i.e. Walmart) or premier brand prestige (i.e Apple) has little trouble out-performing their peers.[1]

[1] This remains true for Walmart and Apple, as each lead their respective industries in a variety of financial metrics such as revenue and net income.

Thus, the ideas espoused by the likes of Buffett and Porter have become more prominent in recent years, particularly with respect to investing. In the early 2000's, for instance, Morningstar, a leading investment research firm headquartered in the United States, began to formally assess *economic moats*, which it defines as the likelihood a company can maintain a sustainable competitive advantage and thus keep competitors at bay for an extended period of time (*Morningstar Investing Glossary*). More specifically, the firm thoroughly assesses a number of competitive advantage attributes -- the most notable ones being cost advantages, customer switching costs, intangible assets (i.e. brand identity; patents; sustainability measures), network effects, and scale advantages -- in order to determine a company's ability to succeed in both the short and long-term.[2] And since starting this practice, Morningstar has championed its economic moat analysis as a hallmark of its investing philosophy and a crucial determinant of its fair value share price recommendations (Lopez, 2003).

However, there is not a consensus within the economic moat literature supporting the notion that wide-moat stocks make for superior investments. While a couple of studies, such as Boyd (2005) and Kanuri and McLeod (2016), found evidence indicating that wide moat stocks outperform the broader market, Liu and Mantecon (2016) made a compelling case *against* wide moat stocks, showing that when compared to stocks assigned either *narrow* or *no* moat ratings according to Morningstar,[3] companies deemed to have limited capabilities actually posted higher average annual stock returns than the distinguished wide moat companies over an eight-year sample period. And to add support to their argument, the authors referenced noteworthy studies by the likes of Fama and French (1995) that called into question, for instance, the relative

[2] These moat attributes will explained further in Section II b) of the literature review.

[3] Narrow and no moat ratings, in essence, signify that a company either possesses only a potential source of a sustainable competitive advantage (narrow moat) or no source of advantage at all (no moat).

success of large growth stocks, many of which are widely believed to possess seemingly "unbreachable" moats in the words of someone such as Buffett (Morningstar, 2004).

My thesis contributes to this conversation by empirically assessing Morningstar's economic moat ratings over a ten-year time-frame in order to answer the following research question: do wide moat stocks make for a superior investment compared to narrow and no moat stocks? My study also examines a relatively under-studied topic within the economic moat literature pertaining to possible stock return differences across sectors. I analyze three sectors specifically -- technology, healthcare, and consumer defensive -- as well as a number of industries within each of these sectors to determine if any differences in stock performance relative to moat status arise.

Surprisingly, my conclusions suggest that wide moat stocks do not necessarily make for a superior investment. From 2008-2017, I found that a negative relationship existed between the selected wide moat companies in my study and average annual stock returns, as an upgrade from non-wide to wide moat status was found to decrease annual stock returns by 5.15%. This relationship was also statistically significant at the 5% level. Moreover, no moat stocks were found to be positively related to returns (coefficient = 0.02), suggesting that relative to the narrow moat benchmark, no moat stocks yielded roughly 2% higher annual returns. Similar conclusions were also found for a majority of the sectors and industries under observation: neither the healthcare, consumer defensive, and technology sectors, for instance, reported wide moat variable coefficients that were both positive and statistically significant. Taken together, my results contribute to the economic moat literature by providing further empirical evidence as to the relationship between competitive advantage and stock performance while also adding a

sector and industry-specific component that had been previously under-studied in the literature. Moreover, my findings also relate strongly to conclusions reached by Liu and Mantecon (2016), adding further doubt to prevailing investment strategies that advocate in favor of companies with sustainable competitive advantages.

This paper will proceed as follows: Section II provides an in-depth review of the origins of the competitive literature as well as a summary of the noteworthy studies related specifically to economic moats; Section III discusses methodology and my regression model specifications; Section IV contains a breakdown of data sources as well as a brief summary of my data collection process; Section V includes a discussion of all noteworthy results; Section VI provides an explanation for the reported results, as well as an acknowledgement of my study's limitations; Section VII concludes the paper with suggestions for future research and offers final takeaways.

II. Literature Review

One of the fundamental principles in economics is the idea that a firm's economic profits will regress to zero in the long-run after accounting for opportunity costs. Nearly every introductory microeconomic textbook examines this trend, particularly with respect to monopolistic competition.[4] And though this theory relies on a number of caveats, such as assuming unrestricted access to markets and using a stricter definition of the term profit,[5] it is still a common belief that profits will at least trend toward zero as new firms enter successful

[4] McEachern (2013), for instance, stated the following in his chapter on monopolistic competition: "Low barriers to entry in monopolistic competition mean that short-run economic profit attracts new entrants in the long-run...Entry continues in the long-run until economic profit disappears" (pg. 218).
[5] In reality, financial profits are used as a measure of performance rather than economic profits, which are difficult to truly assess.

industries. For instance, Stiger (1963) said, "There is no more important proposition in economic theory than that, under competition, the rate of return on investment tends toward equality in all industries. Entrepreneurs will seek to leave relatively unprofitable industries and enter relatively profitable industries" (p. 54).

Recent studies have examined this trend in greater detail. Fama and French (2000), for example, assessed whether profitability regresses toward industry averages by compiling a cross-sectional dataset with financial information dating from 1964-1995. Using pooled time-series regressions inclusive of an annual average of 2,343 firms in their dataset, the authors found strong empirical evidence in support of their hypothesis that profitability is mean-reverting. They also concluded that mean reversion is stronger when a company's profits are further from its industry's mean. In other words, when profits are unusually high (or low, for that matter), mean-reversion is even more likely to occur.

Not only are these conclusions in accord with standard economic theory concerning the long-term trend of profits, but they have implications with respect to stock investing. Most notably, these ideas relate to a fundamental financial economic theory first presented by Eugene Fama in 1970 called the *efficient market hypothesis*, which posited that share prices take into account all publically available information, thus decreasing opportunities to construct superior portfolios comprised of companies that consistently beat the market.[6] Although Fama's hypothesis fails to explain the success of investors such as the aforementioned Buffett, arguably the most noteworthy connection between the efficient market hypothesis and the time-series trend of profits is that long-term investing success relative to the market is similarly difficult to

[6] To clarify: this is the same Fama that co-authored the aforementioned mean-reversion paper along with Kenneth French.

sustain, primarily because it is assumed that all investors are equipped with the same information to accurately evaluate companies.

Important implications also exist as to the role investor responses play with respect to both the time-series trend of profits and the efficient market hypothesis. To explain why theories such as Fama's efficient market hypothesis do not necessarily hold true in reality, many financial and behavioral economists have explored how investor sentiment affects share prices. Baker and Wurgler (2007), for instance, discussed how a number of psychological factors, such as availability bias and overconfidence, have been found to dramatically affect stock prices. They noted that these implicit biases also vary among investors, resulting in differing reactions as to the evaluation of a company's financial fundamentals. Consequentially, investor awareness may influence sentiment toward a company, and therefore influence its stock returns. And as I will later discuss with respect to my results, this phenomenon may occur with respect to the stock performance of companies considered to be well-positioned to successfully compete in the future.

II a) Michael Porter and the Emergence of Competitive Advantage Literature

Since no firm would willingly allow their company's profits to decline, companies began investing their energies into combating this profit regression trend. This, in turn, gave rise to the competitive advantage literature, which began largely with Michael Porter's work in the early 1980's. Starting with his book *Competitive Strategy* (1980), Porter discussed the ways in which firms can gain favorable competitive positions in their industry. It is worth mentioning that he grounds his arguments by commenting first on the aforementioned mean-reversion tendency in

profits.[7] He then introduced a number of important concepts that help assess whether a firm can keep competitors at bay, the most notable one being his "Five-Forces" framework (i.e. the five competitive forces that determine industry attractiveness) which continues to be applicable to firms looking to implement successful competitive strategies today. In no particular order, these forces are: the entry of new competitors, the threat of substitutes, the bargaining power of buyers, the bargaining power of suppliers, and the rivalry among existing competitors.

Porter furthered discussed these concepts in one of his next books, *Competitive Advantage* (1985). *Advantage* continued to detail industry-specific views concerning competitive positioning while also addressing how a firm might implement and sustain a competitive edge in its particular industry. For instance, he augmented his Five Forces framework by stressing the importance of firms establishing either a cost advantage or differentiating qualities. Additionally, Porter was one of the first in the literature to identify the dynamic nature of competitive advantage. In other words, favorable positioning in the present does not guarantee favorable positioning moving forward due primarily to what Porter cited is an "unending battle among competitors" as well as changes in industry attractiveness. He used Ford Motor Company as an example to illustrate this trend, as Henry Ford's innovative manufacturing techniques in the 1910's helped Ford initially dominate the emerging automobile industry before new firms entered and adopted similarly advanced production processes in the late '20's, causing Ford's substantial edge to decline.

Porter's contribution to the competitive advantage literature has been largely unmatched, as numerous other authors, some of whom will be discussed shortly, have cited his framework as

[7] As he said on Page 9: "The threat of entry determines the likelihood that new firms will enter an industry and compete away the value, either by passing it on to buyers in the form of lower prices or dissipating it by raising the costs of competing."

the foundation of their studies. It will also soon be relatively easy to see why Porter's arguments are relevant to this thesis. Economic moat analysis not only expands on Porter's Five Forces to include qualities such as brand identity, intangible assets, and network effects, but it already includes factors such as cost advantages and threat of entry.

One minor critique of Porter's Five Forces model, however, is that his work may be a bit oversimplified and, in turn, outdated given that both *Strategy* and *Advantage* were originally published over thirty years ago.[8] Moreover, Porter focused entirely on how firms can capture value from consumers. He was not interested in how competitive advantages may affect stock performance, which makes his work relatively less relevant to this thesis.[9] It is also worth mentioning that Porter's arguments are entirely theoretical, providing future authors an opportunity to provide empirical support to his conclusions.

Nonetheless, the competitive advantage literature divulged into two sections following Porter's publications: industrial organization (IO) and resource-based theories. The latter has been analyzed much more frequently in the competitive advantage literature, though, largely because it concerns factors within the firm's control and addresses specific factors that lead to competitive advantage. However, before discussing the resource-based literature, it is worth at least commenting on the industrial organizational view because it is still essential in forming the foundations of the competitive advantage literature. And as it relates to this thesis, it is worthwhile to note why the literature has marginalized this theory.

Unsurprisingly, it was Porter (1981) who summarized the prevailing developments concerning IO theories and their impact on strategic management. Unlike his two

[8] For instance, he did not offer specific details as to what supplier power entials, nor did he provide nuanced suggestions for how a firm can identity and strengthen its authority among other business partners.
[9] Granted, it could be argued that delivering superior value can ultimately drive successful stock performance.

aforementioned works, Porter incorporated literature published by a number of other authors in his assessment of IO's current implications on strategy as well as its possible areas for improvement. For instance, he analyzed the Learned, Christensen, Andrew, and Guth (LCAG) framework introduced in 1969, which asserted that successful firms must analyze four key strategic elements in order to match their strengths with external environmental conditions.[10] He also commented on the Bain/Mason IO paradigm, which essentially argued that firm performance depends largely on its industry environment.

Porter outlined various reasons why these models have not been widely accepted with respect to managerial decisions. For instance, Porter noted how these models, particularly the Bain/Mason paradigm, were too rigid in terms of how firms could determine their own fate. As he stated: "Traditional IO theory took industry structure as exogenously given, and held that the firm's strategy and performance was fully determined by this structure. Thus the firm was stuck with the structure of its industry and had no latitude to alter the state of affairs." Porter did remark, however, that many recent studies attempted to solve these issues -- some with more success than others. Nonetheless, he concluded by stating that IO theories provided more significant implications regarding political policy than strategic development.

Powell (1992) is another author who analyzed industry factors and their effect on competitive advantage. His paper, which examined the organizational alignments in manufacturing industries, is particularly noteworthy because he ultimately concluded that industry factors are overrated: external factors, such as industry-wide employment and industry

[10] These elements are: 1) company strengths and weaknesses, 2) industry economic and technical opportunities/threats, 3) personal values of key implementers, and 4) broader societal expectations.

stability,[11] only partly explained what he identified as "supernormal" profits, whereas the firm-specific components included in his empirical analysis, such as a CEO's influence on decision-making, could better explain profitability while holding industry factors constant. Thus, Powell concluded that resource-based factors seemed to be more useful in explaining how competitive advantage can drive profits. And though Porter continued to rely heavily on IO theories in constructing his competitive advantage models outlined in *Competitive Advantage*, these two studies help clarify why the literature began to concentrate on resource-based views.

Meanwhile, nearly all of the competitive advantage articles related to resource-based views (RBV) are grounded in early ideas presented by Wernerfelt (1984). For starters, his paper was the first to specifically coin the term *resource-based view*. His work was also significant because he built on Porter's Five Forces model in order to assess how firms can best utilize their resources (which he defined as a firm's strengths and weaknesses) to achieve higher profitability.

Additionally, Wernerfelt identified a number of other factors that could theoretically contribute to competitive advantage. Some of the most notable with respect to economic moats are what he called *attractive advantages*, which he defined as resources or capabilities that either directly or indirectly make it difficult for competitors to successfully compete. He specifically noted factors such as machine capacity, or production processes that lead to higher returns to scale, which today can be defined more simply as *scale advantages*. He also identified customer loyalty and technological leads as other potential factors. This again relates to economic moat factors such as brand identity, which helps drive customer loyalty, and network effects, which are often a product of advanced technology. In short, Wernerfelt did a terrific job at further

[11] This metric was defined by the author using a report from the U.S. Department of Commerce's ranking of industry stability.

establishing the theoretical components of competitive advantage. It could also be argued that he offered even more insight than Porter: his ideas are more nuanced, as they not only include more specific advantage drivers like machine capacity and production experience, but other elements such as mergers and acquisitions and other avenues for horizontal and/or vertical integration.

In a similar vein, Barney (1991) was another key contributor to the emerging RBV literature. Barney also incorporated a more firm-specific approach than Porter by discussing the impact of specific firm attributes on competitiveness, which was previously an understudied topic in the competitive advantage literature. The primary result from Barney's conclusions is that he developed four modified indicators of strategic competitiveness: value, rareness, imitability, and sustainability. The four indicators are listed in ascending order of importance. For instance, Barney argued that even if a firm produced a rare product, it could not attain a competitive advantage unless said product was valuable to consumers. In other words, the firm would be able to exploit its edge at producing a rare product if only it is of value to consumers first. Similar to Porter, though, Barney did not offer a quantitative investigation, nor a single real-world example to support his arguments. Thus, it is difficult to affirm Barney's theoretical conclusions, even if what he argued is logical.

Fortunately, Newbert (2008) provided some clarity to this matter. He examined the prevailing arguments in the resource-based view literature, which he believed relied heavily on assumptions, at a conceptual level due to the aforementioned empirical gap. Newbert's hypotheses build on a notion in the RBV literature that resources and capabilities that are

valuable and/or rare allow firms to gain a competitive advantage.[12] In turn, the attainment of said advantages will then drive short and long-term financial performance.

Building largely on work from Barney (1991), Newbert looked specifically at the value and rareness of resources in terms of how they drive competitive advantage and, in turn, financial performance. He outlined five hypotheses, of which three are particularly relevant to this study.[13] These hypotheses are:

- *Hypothesis 1: The value of the resource-capability combinations that a firm exploits will be positively related to its competitive advantage.*
- *Hypothesis 2: The rareness of the resource-capability combinations that a firm exploits will be positively related to its competitive advantage.*
- *Hypothesis 3: A firm's competitive advantage will be positively related to its performance.*

In terms of empirical framework, Newbert responded to a research suggestion by Barney and Mackey (2005) by compiling a sample of 664 micro and nanotechnology companies. He cited two reasons for choosing this particular group of companies. The first reason connected to previous literature by Barney and Mackey arguing that competitive advantages have been most difficult to acquire in "dynamic markets," which he claimed was important for his study because he attempted to understand how firms attain competitive advantages rather than maintain them. Moreover, he argued that since many of these micro and nanotechnology companies are in their

[12] This particular notion is heavily influenced by Barney (1991) and his aforementioned work.
[13] Hypotheses 4 & 5 each concern the mediating role competitive advantage has on the relationship between both value and the resource-capability and its rareness. This component of the study, in short, is not as relevant as his first three hypotheses with respect to this thesis.

infant stages, it will "offer insights" as to the important mediating role of competitive advantage outlined in hypotheses 4 & 5. Newbert's explanations for choosing micro and nanotechnology companies, however, are confusing, partly because he did not provide a definition of dynamic markets.[14] Combined with his small survey timespan from the fall of 2003 to the spring of 2004, Newbert's initial explanation of his data choices falls short.

His study also suffered from flawed methodology choices. In order to compile data regarding a firm's value and rareness, Newbert issued surveys to senior-level executives of all 664 companies. This method called for executives to subjectively assess the value and rareness of their companies' own resources and capabilities. Though the author attempted to reduce the potential for bias by adjusting the framing of questions in order to indirectly assess these competitive advantage indicators, the drawbacks of this approach remain obvious with respect to response bias.

Regardless, Newbert compiled hundreds of responses and attributed scores reflecting factors such as the firm's success at reducing costs.[15] He then summarized this data to generate composite scores for the three categories in his study -- value, rareness, and competitive advantage -- and compared those results to various financial performance measures.[16] Using hierarchical ordinary least squares (OLS) regression models to test his five hypotheses, Newbert ultimately found support for the three hypotheses mentioned above. In other words, he concluded that both value and rareness are positively related to competitive advantage, while competitive

[14] He cited previous literature with respect to this definition, inferring that one must review other articles to gain further understanding.
[15] This is one measure he cited for how a firm derives value.
[16] His financial performance data, for the record, was also gathered using these surveys. However, this choice was not as questionable because a) he incorporated various objective metrics (such as revenue and operating margin) and b) these subjective measures had been used frequently in previous literature.

advantage is indeed positively correlated with performance. Thus, despite the study's numerous shortcomings, Newbert confirmed that RBV hypotheses are now no longer entirely based on assumptions.

II b) Competitive Advantage and Stock Performance: The Rise of Economic Moats

Arguably the main shortcoming of the aforementioned studies with respect to this thesis is that they did not analyze the relationship between competitive advantage and stock performance. In fact, this area of concentration within the competitive literature has only been examined by a few authors such as Gjerde et al. (2010). Their study contributed to the conversation by introducing a method for which competitive advantage can be measured as a single-variable in order to determine whether resource-based or industry-based competitive advantage is more responsible for abnormal stock performance.

The authors' attempt to categorize the two types of competitive advantage is particularly noteworthy. Their method stated that industry-based advantages were earned if return on equity capital was larger than the average cost of equity capital determined by the capital market. Resource-based advantages, meanwhile, were classified based on whether a firm had a cost of equity capital below the industry's average cost of equity capital. However, though their definition of industry-based advantage is reasonable considering it is in accord with a widely-accepted definition used by Barney (2007), their methodology for determining resource-based advantages is questionable because it has no precedent in the literature. It also lacked details such as value and rareness that, as mentioned by Barney (1991), have been found to drive resource-based advantages.

One strength of this study's data and methodology, though, is that it included a significant sample of companies. The authors' data included 3,051 firm-year observations from 1986-2005 of an assortment of publicly-traded Norwegian companies.[17] The large time-frame and variety of companies help add support to this study's conclusions.

In order to test these hypotheses, the authors used binary correlation coefficients and multiple OLS regressions to confirm that the two sources of competitive advantage related positively to abnormal stock performance. However, these results were only statistically significant for resource-based competitive advantages, which they found to be significant at the 1% level. Industry-based competitive advantage, on the other hand, was not found to be statistically significant even at the 10% level. Furthermore, the authors performed numerous robustness tests, such as splitting the 20-year period into smaller time interval sections, and still came to the same conclusions, which lends further credence to their support of resource-based competitive advantages as a contributing factor to superior stock performance.

Other studies, meanwhile, have analyzed the relationship between specific competitive advantage attributes, such as the four outlined by Barney (1991), and stock performance.[18] Arguably the most notable one to be studied recently is sustainability. Kruger (2015), for instance, analyzed how the markets responded to events related to corporate social responsibility (CSR). Using a uniquely constructed dataset of 2,116 CSR events from 2001 to 2007, he found that investors reacted negatively following both negative and positive events, although the reaction was far stronger for negative events. Nonetheless, the latter conclusion concerning negative reactions to seemingly positive developments is still surprising, but Kruger reasoned

[17] All companies were listed on the Oslo Stock Exchange.
[18] Recall that the four attributes outlined by Barney were value, rareness, imitability, and sustainability.

that stock investors likely think negatively of CSR initiatives regardless if they are deemed to be a positive event.[19]

One of the strengths of Kruger's paper is his effort to account for endogeneity issues. As he explained with respect to previous studies investigating CSR's effect on stock performance, the observance of a positive relationship between the variables can be interpreted in two different ways: socially responsible firms may earn higher profits or perhaps firms that earn higher profits are more likely, in turn, to be socially responsible. Kruger accounts for this potential reverse causality issue, though, by using an event study to measure short-term changes in shareholder value.

However, given the challenges in identifying observable events related to other competitive advantage attributes,[20] potential endogeneity issues still exist with respect to the relationship between competitive advantage and stock performance and are thus a possible reason why this relationship has been relatively understudied.[21] Another reason is that competitive advantages are difficult to examine empirically. After all, there is hardly an objective technique for measuring competitive advantage -- and those that have used a quantitative procedure to measure it, such as Gjerde et al (2010), made questionable decisions concerning their definitions because some of their methods had not been supported by past literature.

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[19] This makes sense theoretically because CSR initiatives tend to be rather costly.

[20] In other words, the difficulty in determining what constitutes a competitive advantage "event study" has likely deterred scholars away from this subject. Perhaps a news headline such as "Apple's brand identity recently named number one among S&P 500 companies" could constitute as an intangible asset event, but the precise specifics of these sort of measurements obviously would need further clarification. This gap in the competitive advantage literature, however, will be discussed further in this paper's conclusion.

[21] Scholars, in short, have yet to confirm whether competitive advantages may drive superior stock performance, or whether superior stock performance actually may lead to competitive advantages.

More recently, however, a new term for competitive advantage -- economic moat -- has emerged in the financial world and assisted in this dilemma. The term was first coined by famed investor and Berkshire Hathaway chairman Warren Buffett, who in his annual letters to shareholders would continuously reference firms with "economic castles protected by unbreachable moats" as one of the primary factors he looks for in a profitable investment (Morningstar 2004). Due largely to Buffett's investing success,[22] many investment and investment research firms have recently popularized this strategy predicated around finding companies with economic moats.

The most notable example is undoubtedly Morningstar, an independent investment research firm whose platforms are widely used by other companies in the financial services industry.[23] Morningstar goes to great lengths to assess the strength of a firm's economic moat. The firm provides in-depth analyst reports, for instance, on over 1,000 publicly-traded companies; and in each of these reports, a section is devoted to assigning and explaining the particular company's economic moat rating. More specifically, Morningstar's committee of senior researchers uses a combination of quantitative and qualitative factors to assess the specific attributes that determine a company's economic moat rating. The five main attributes it analyzes, as stated in its investing glossary, are as follows:

[22] Berkshire Hathaway's market capitalization is close to $500 billion. Buffett also reportedly has a net worth of over $80 billion.

[23] Morgan Stanley, for instance, relies heavily on Morningstar's analysis when preparing stock and ETF reports for clients.

Moat Attribute	**Explanation**	**Example**
Cost advantage	Any structural advantage that enables firms to reduce costs and/or charge lower prices	**McDonald's** sells cheeseburgers for as little as $1, far below the cost of a burger at many other restaurants
Efficient scale	When a market is effectively served by only one or a small number of companies; usually occurs when market has high barriers to entry.	Morningstar cites energy companies such as **Enterprise Products Partners** that have natural geographic monopolies that are essentially unbreachable by competitors as noteworthy examples.
Intangible assets	Includes patents, brand identity, corporate sustainability initiatives, company culture, and any other intangible factor that contributes to a firm's ability to charge a premium price or prevent competitors from duplicating the success of a company's product or service.	**Apple's** strong brand identity -- it was ranked as the world's #1 global brand by Interbrand in 2017 -- drives profits for the iPhone, which contributes to superior performance over the likes of Samsung.
Network effects	Occurs when value of a platform or service increases as more consumers and/or sellers join.	**eBay** becomes more valuable as more buyers search for products on the site, which incentivizes more sellers of products to list their items.
Switching costs	How easy is it for a customer to switch to a competitor's product?	An airline that secures a contract with an airplane producer like **Boeing**, for instance, is likely locked in to paying billions for planes over a number of years.

It should be noted that these five attributes are not necessarily the only ways in which a firm can achieve an economic moat. Other variables, such as government assistance for a large aerospace & defense company like Boeing, could be another source of competitive advantage.

Moreover, as mentioned above, Morningstar's economic moat assessments are both qualitative and quantitative in nature. With respect to the latter, the firm's researchers analyze metrics such as the spread between a company's return on invested capital (ROIC) and its cost of capital. It also compares other key ratios, such as return on equity (ROE) and return on assets (ROA), across companies to assess whether a company has held a dominant position in its industry (Morningstar Indexes Yearbook).[24] However, these evaluations do not employ advanced econometric techniques,[25] as Morningstar's analyst reports not only tend to use rather unadvanced quantitative metrics, but these metrics oftentimes are referenced in order to support the analyst's largely qualitative argument.[26]

Nonetheless, Morningstar's adoption of this strategy has allowed for a number of possible breakthroughs regarding the further study of competitive advantage with respect to stock performance. For starters, the attributes used to assess economic moat ratings are grounded in often-cited and heavily supported work by the likes of Porter (1980, 1985) and Barney (1991). Moreover, economic moat ratings help solve issues that plagued the likes of Newbert (2008) and Gjorde et al. (2010) concerning how those authors defined competitive advantage. Whereas those authors relied on faulty assumptions when determining their single-variable metrics, Morningstar relies on objective analyst assessments that incorporate a number of quantitative and qualitative factors.[27]

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[24] With respect to ROE, for example, Morningstar prefers companies to have a figure above 20% in order to be deemed a wide moat company.

[25] For example, I have seen analyst reports in which the analyst will cite a company's ranking on Interbrand's brand identity power rankings in order to argue that it has a recognizable brand.

[26] See Appendix, Table 12 for a diagram that further illustrates Morningstar's moat rating process.

[27] It is likely that these analyst reports are trustworthy due to the fact that Morningstar is one of the most popular investment research firms and is currently relied upon by major financial service firms like Morgan Stanley.

Moreover, Morningstar's moat ratings also allow for easier classification between firms deemed to have sustainable and unsustainable competitive advantages. Those with sustainable competitive advantages are classified as "wide moat" firms. Those with either flimsy advantages or competitive advantages that are not necessarily sustainable moving forward are classified as "narrow moat" firms. Those with no competitive advantages to speak of at all are classified as "no moat" firms. These classifications are vital to this thesis, as they allow for a simpler, and perhaps even more accurate framework, to identify competitive advantage and track subsequent stock performance.

Additionally, there is an important time component to the evaluation of economic moats worth mentioning as well. The dynamic nature of competition as described by Porter (1980) means a company's moat status could be wide one year and narrow the next. Thus, Morningstar updates its analyst reports on a three to six month basis and, if necessary, revises its economic moat classifications.

II c) Studies Evaluating the Success of Wide Moat Firms

Given the abundance of theoretical, rather than empirical, studies evaluating competitive advantage discussed previously, the question then becomes whether the same is true for the economic moat literature: have authors studied whether wide moat firms actually achieve superior stock market performance? In short, the literature is also relatively thin with respect to studies that empirically assess the success of wide moat firms.

Granted, there are a few obvious reasons why this is the case. For starters, Morningstar did not fully embrace economic moats as part of its investing philosophy until the early 2000's.

The firm also did not begin to formally include economic moat analysis as part of each analyst report until roughly 2002. Morningstar's archives, in turn, do not provide a very long time-frame in order to empirically assess the long-term merits of this strategy. Moreover, perhaps pre-conceived notions play a role as well. Other authors in the competitive advantage literature, for instance, seemed to take for granted that ideas such as Porter's Five Forces and Barney's drivers of competitive advantage would naturally lead to superior financial and/or stock performance if a firm possessed such advantages. However, this assertion fails to thoroughly account for issues such as endogeneity.

Nonetheless, with respect to the economic moat literature, surprisingly there is *not* a consensus concerning whether wide moat firms make for superior investments. But before assessing the study that throws Morningstar's investing philosophy into question, I will first discuss Boyd (2005) because he was one of the first authors to formally use Morningstar's economic moat ratings in a study testing Buffett and Morningstar's "intuitively appealing" premise that wide moat stocks make for superior investments. In addition to examining the stock performance of large and mid-cap companies with wide moats from 2000 to 2004, the author was interested in confirming both Buffett and Morningstar's claim that companies with sustainable competitive advantages follow an upward earnings trajectory.[28] Boyd claimed to find support for both of his hypotheses. Wide moat firms did achieve superior stock performance based on Value Line's measure of price growth persistence and Boyd argued that there was also evidence that these stocks had positive earnings stability.[29]

[28] These wide moat large-cap stocks, for the record, are known as Morningstar's Bellwether 50.
[29] Value Line's model, in short, assesses share price growth compared to the growth of an average stock. According to Boyd, these persistence ratings "range from 100 (highest) to 5 (lowest)" (51).

However, a notable shortcoming of this study is its surprising lack of empirical support. In other words, Boyd essentially argued that since these stocks appeared to sustain their earnings per share figures, as well as the fact that 39 of the 50 wide moat large-cap stocks in Morningstar's Bellwether 50 noticeably outperformed the market, wide moat stocks therefore deliver superior returns. While not necessarily wrong, this evidence alone is not entirely convincing because it does not feature a regression model, nor does it account for possible control variables such as the overall performance of the market.

Kanuri and McLeod (2016), however, provided a stronger case for wide moat stocks. Their study analyzed whether wide moat companies deliver superior returns relative to two standard benchmark indices: the S&P 500 and Russell 3000. The authors used Morningstar's moat classification system to assemble an initial portfolio of wide moat stocks starting in 2002, which they continuously updated until 2014 as Morningstar reevaluated its moat ratings. Kanuri and McLeod then gathered a variety of risk-adjusted performance (RAP) measures, such as Sharpe and Sortino ratios, to thoroughly assess the performance of the portfolios on a monthly and yearly basis. The authors ultimately concluded that the wide moat stocks had higher returns relative to the two indices even while adjusting for risk. These returns were also statistically significant at the 1% level.

This study had a few noteworthy elements that not only added merit to the authors' conclusions, but have particular relevance with regard to this thesis. First, in contrast to Boyd, who examined only a five-year dataset, Kanuri and McLeod constructed annual portfolios of wide moat companies over a 12-year period. This longer time-frame (June 2002 to May 2014) is less prone to selection bias, as it encompassed both the years before and after the Great

Recession of 2007-08. The twelve-year period also allowed for a better assessment of Morningstar's buy-and-hold strategy for these wide moat companies.

Additionally, the study offered a variety of other conclusions that are far more nuanced than a study such as Boyd's. For instance, the authors found that the wide moat portfolio had a higher aggregate Sharpe ratio,[30] which suggested that the wide moat portfolio compensated investors better relative to the risk method. They also reported a higher Sortino ratio, which indicated that the wide moat portfolio was less likely to incur heavy losses.[31] Moreover, their results were strengthened by other robustness checks which factored in models such as Carhart's Four Factor Model (1997), which adjusts for "momentum," or previous acceleration in share growth over the previous twelve months. The authors also included a separate model which only examined data during the Great Recession from 2007-2009. In both cases, support for their conclusions was strengthened.[32]

One notable shortcoming of Kanuri and McLeod's study, though, was that they did not compare the stock performance of wide moat firms in relation to narrow and/or no moat firms. In theory, such an analysis could provide even more support for wide moat stock investing because it could prove if wide moat stocks not only outperform the market, but if they outperform portfolios comprised largely of narrow and no moat stocks as well.

However, as mentioned earlier, there is *not* a consensus in the economic moat literature: a recent study by Liu and Mantecon (2016) that compared the stock performance of wide moat

[30] More formally, the authors explained that Sharpe ratio "evaluates how well an investment compensates its investor for each unit of risk incurred."
[31] As stated by the authors, "a large Sortino Ratio indicates low risk of large losses occurring."
[32] In the case of the Great Recession dataset, for instance, the authors found that while the wide moat stocks posted only a -2.62% average monthly return, this portfolio still outperformed the S&P 500 (-3.15%) and Russell 3000 (also -3.15%).

firms versus narrow and no moat firms surprisingly found that firms with *no* economic moat outperformed those with wide moats. In other words, firms with absolutely no evidence of a sustainable competitive advantage somehow outperformed companies that an investor like Buffett would praise for having "unbreachable moats" (Morningstar, 2004).

On the surface, this conclusion does not make much sense; but from an empirical perspective, the authors' case was fairly convincing. After assembling annual portfolios of stocks based on whether Morningstar assigned a wide, narrow, or no moat rating, the authors found that no moat portfolios outperformed the wide moat portfolios by an average of 7% annually.[33] However, when they included a larger variety of controlling variables into their Fama and MacBeth (1973) regression model[34], this conclusion was not found to be statistically significant even at the 10% level.

Thus, the authors then decided to expand the time-frame of their study in order to decrease the likelihood of sampling bias. One problem, though, was that Morningstar's moat ratings only dated back to the 2000's, so Liu and Mantecon made the ambitious choice to study the determinants of moat rating and constructed a quasi-predictive framework for moat status that could theoretically allow them to assess competitive advantage dating back to 1964.[35] Again, this was an ambitious choice, but the larger time span strengthened the authors' conclusions, as no moat firms again outperformed wide moat firms.[36]

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[33] Narrow moat firms, for the record, also outperformed wide moat firms, but this result was only based on the authors' summary statistic table. For some reason, the authors did not include narrow moat firms into their regressions -- they exclusively studied the performance of wide moat versus no moat firms.
[34] Variables included size, book-to-market ratios, beta, earnings yield, and financial leverage.
[35] In other words, the authors assessed the likelihood that firms with, say, a larger market capitalization received a wide moat rating and extrapolated those probabilities across a variety of companies in order to construct a large dataset from 1964-2011.
[36] These results were also statistically significant based on the authors' Fama-MacBeth regressions, although they were significant at only the 10% level.

Empirical results aside, the intuitive case explaining why no moat firms outperformed wide moat firms in terms of stock performance is also compelling. The authors mentioned, for instance, that even if a firm has a competitive advantage, this advantage may already be factored into the share price. This idea relates strongly to the aforementioned efficient market hypothesis, which posited that share prices take into account all publically available information, thus decreasing opportunities to find companies that consistently beat the market.

Moreover, the authors also asserted that wide moat stocks were far more stable than no moat stocks, as the median annual return for wide moat firms was significantly higher than no moat firms (8.0% vs -2.7%). To explain why no moat firms performed better overall, the authors presented evidence relating to how the no moat stock portfolios were driven by a few extreme examples: only eight firms, for instance, experienced exceptional stock growth higher than 1,000 percent over the sample period. Unsurprisingly, all eight of these firms were no moat stocks.

Furthermore, the authors found that the wide moat portfolios were mostly comprised of large growth stocks.[37] Liu and Mantecon cited empirical evidence in their literature review arguing that large stocks tend to have lower annual stock returns, while other studies, such as Lakonishok et al. (1994) and Fama and French (1995), attest to the profitability of value stocks over growth stocks.[38] Lakonishok et al, for instance, found evidence of mean-reversion and lower returns for growth stocks compared to value stocks. In other words, even though the growth firms in their sample had superior financial numbers than the value firms, higher expectations for future growth rates combined with profits gradually regressing to the industry mean suggested

[37] 94% of the wide moat stocks in their portfolios, for instance, had large market capitalizations. Another 74% were growth stocks, which was markedly higher than the percentage of growth stocks in the no moat portfolios (34%).
[38] Value stocks, in short, refer to companies whose shares are trading below market level. These companies, as Liu and Mantecon state, tend to have weaker fundamentals, such as high book-to-market ratios. Growth stocks, in contrast, refer essentially to expensive stocks, or stocks that are value more highly by the market.

that value stocks actually made for the better investment. Fama and French, meanwhile, came to a similar conclusion, suggesting that over the course of a 22-year sample, value stocks had higher monthly growth rates than growth stocks despite the latter group including far more popular companies as evidenced by ratios such as price/earnings (P/E).

II d) Summary

To relate this discussion back to the introduction of my literature review, Liu and Mantecon (2016) arrived at these surprising conclusions despite also proving in another component of their study that wide moat stocks were far less likely to experience mean-reverting tendencies, such as declining profit margins and return on equity. So how can one further explain the underperformance of wide moat stocks despite these companies exhibiting characteristics of sustainable performance, as predicted by the likes of Buffett and Morningstar?

In short, the results of this paper pose a number of questions related to the competitive advantage literature, specifically with respect to whether firms that possess sustainable advantages outperform those without such competitive abilities in the stock market. As mentioned previously, the competitive literature originally developed by the likes of Porter (1980, 1985) and Barney (1991) seemed to reach a consensus regarding whether a firm that successfully produced products or services that were viewed as valuable, rare, or inexpensive achieved superior financial performance. Empirical studies, such as Newbert (2008), reached this conclusion as well.

There is not a clear consensus with respect to stock performance, though, based on Liu and Mantecon's paper. Their results throw investing philosophies from the likes of Morningstar

into question, although it is important to remember the conclusions reached by Gjerde et al. (2010), Boyd (2005), and Kanuri and McLeod (2016) supported investing strategies predicated around wide moat stocks. Still, Liu and Mantecon's argument that wide moat stocks may be overrated is not without merit based on widely-accepted literature presented by Fama (1970), Lakonishok et al. (1994), and Fama and French (1995).

Therefore, this thesis will add clarity to the conversation by assessing the relationship between economic moats and stock performance. More specifically, this study will provide empirical evidence based on an assessment of Morningstar's economic moat ratings over a ten-year stretch (2008 to 2017) in order to answer the following research question: do wide moat stocks make for a superior investment compared to narrow and no moat stocks? Additionally, while most of the competitive advantage literature has paid particular attention to resource-based advantages as a driver of firm performance, my thesis will focus on sector and industry-related factors, which have been largely neglected by the literature yet may be more relevant in terms of explaining stock performance than previously thought.

While the precise empirical relationship between wide moat companies and stock performance may be ambiguous based on Liu and Mantecon's conclusions, my hypothesis is that wide moat stocks will generate higher returns than non-wide stocks in all facets of my empirical analysis. This expectation is based on the abundance of theoretical papers published by the likes of Porter (1980, 1985) and Barney (1991), as well as the moat-specific studies by authors such as Kanuri and McLeod (2016) and Boyd (2005), that have confirmed the importance of competitive advantage.

But as Liu and Mantecon (2016) proved in their paper, perhaps such information is already priced into the stock market -- and perhaps the investment strategies hailed by firms such as Morningstar place excessive weight on wide economic moats. The empirical ambiguity with respect to this hypothesis, therefore, means that it is possible I will find unexpected signs with respect to my primary hypothesis. The following sections describing the methodology and results from my study will determine if that is the case.

III. Methodology

Building largely on methodology used by Liu and Mantecon (2016), my empirical model will feature competitive advantage (i.e. economic moat status) as the study's primary independent variable in order to analyze whether competitive advantage contributes to superior stock market performance. More specifically, economic moat status will be factored into a regression model that includes a number of company-specific dependent variables, such as annual stock returns and annual stock returns relative to overall market performance, designed to assess whether wide moat stocks make for particularly profitable investments compared to companies designated as having narrow or no economic moats. Thus, my study differs from Boyd (2005) and Kanuri and McLeod (2016), whose papers focused specifically on wide moat firms and whether they outperform the market, and is most similar to Liu and Mantecon (2016). The latter study included companies categorized under each of Morningstar's moat classifications in an effort to assess whether wide moat stocks outperformed narrow and no moat stocks. My thesis will do the same.

Another component of their study that I will emulate is how the authors first discussed general comparisons regarding the sample's annual portfolio performance of wide, narrow, and no moat stocks. Since their results showed that wide moat stocks had both lower raw and market-adjusted returns, the regression models became even more consequential in terms of further detailing the relationship between economic moats and stock performance. Moreover, the authors included a wide range of control variables, such as market capitalization, book-to-market ratio, and price-to-earnings ratio, that have been used previously in the financial economic literature by the likes of Fama and MacBeth (1973) and Fama and French (1993). My study will follow the same strategy as Liu and Mantecon by including the following company-specific control variables in order to further explain differences in stock performance: market capitalization, price-to-book, and price-to-earnings. I will explain why I selected these particular variables shortly.

The main difference between my study and Liu and Mantecon (2016), however, is with respect to how I will segment the stock portfolios. Whereas their study only classified the companies in their annual portfolios based on moat status, I will also classify my portfolios by sector because sector-related factors are an understudied topic within the economic moat literature as it relates to stock performance. In other words, I will determine whether competitive advantage is a greater influence on stock performance in certain sectors rather than others by running separate regressions for stocks in the technology, consumer defensive, and healthcare sectors. Moreover, I will also examine whether any significant results arise from running separate regressions based on specific industries within each of the aforementioned sectors. Nine

industries qualified for inclusion in this component of the study based on imposed sample size requirements.[39] A list of these nine industries can be found in Table 1 of the Appendix.

The three sectors that are included in this dataset, however, were chosen for a few reasons. For starters, after segmenting companies by sector through Morningstar's premium stock screener, the three selected sectors had the largest sample of companies that fit all of my requisite data requirements (more on data qualifications in Section IV). In addition, each of these sectors possibly feature industry-specific effects that may make moat status more valuable in certain industries. Many companies in the technology sector, for instance, are known to have wild fluctuations in share prices, as evidenced by the Dot Com bubble in the early 2000's. Perhaps this pressure to consistently produce innovative products makes the industry more volatile, and moat status, in turn, less secure. The healthcare industry, in contrast, appears to be more stable: citizens are in constant need of healthcare; there are usually high start-up and research & development costs to enter the industry; and government programs often provide these companies assistance, which possibly ensures that many of these firms have the opportunity to post consistent profits. Sustaining a competitive advantage in the healthcare sector, in short, appears to more feasible. Furthermore, it could be argued that the consumer defensive sector serves as a benchmark for economic moat's effect on performance compared to the other two sectors, as many consumer defensive companies, such as Johnson & Johnson, produce products that are often difficult to differentiate in terms of value. Thus, perhaps moat status is less likely to be an influence on returns in this sector, whereas it could potentially have a greater effect on companies competing in the technology and healthcare sectors.

[39] I required a minimum of 70 annual observations for inclusion. Thus, many industries were dropped due to not having a preferable number of observations. Others were also excluded due to collinearity issues in their respective regressions.

III a) Model Specifications

I estimate my main regressions using fixed effects. My formulas are as follows:

1) $Return_{it} = \beta_o + \beta_1 Wide_{it} + \beta_2 No_{it} + \beta_3 Narrow_{it} + \beta_4 MarketCap_{it} + \beta_5 PB_{it} + \beta_6 PE_{it} + \tau_t + \theta_i + \varepsilon_{it}$

2) $AdjReturn_{it} = \beta_o + \beta_1 Wide_{it} + \beta_2 No_{it} + \beta_3 Narrow_{it} + \beta_4 MarketCap_{it} + \beta_5 PB_{it} + \beta_6 PE_{it} + \tau_t + \theta_i + \varepsilon_{it}$

The first dependent variable -- $Return_{it}$ -- represents average annual stock return for stock i in year t, while $AdjReturn_{it}$ accounts for returns relative to the annual performance of the broader market for stock i in year t. The three moat status dummy variables are the primary independent variables under observation. $Wide_{it}$ segments wide moat stocks from non-wide moat stocks (Wide = 1; Non-Wide = 0). No_{it} segments no moat stocks from wide and narrow moat stocks (None = 1; Wide and Narrow = 0). $Narrow_{it}$ segments narrow moat stocks from wide and no moat stocks (Narrow = 1; Wide and None = 0). The first two dummy variables will be particularly insightful with respect to my study's results because they better isolate the performance of stocks based on moat status.[40] Thus, $Narrow_{it}$ will serve as a benchmark for comparison between $Wide_{it}$ and No_{it}. Moreover, this decision to use dummy variables for moat status in order to eliminate any categorical effects that may have hindered the assessment of whether moat status is related to stock performance also follows the same regression framework utilized by Liu and Mantecon (2016).

My hypothesis for $Wide_{it}$ is that it will be positively related to both $Return_{it}$ and $AdjReturn_{it}$. In contrast, my hypothesis for No_{it} is that it will be negatively related to the

[40] In other words, I will be able to more accurately determine whether wide moat stock returns were superior over the selected sample period based on the wide moat dummy variable coefficients as opposed to the narrow moat variable because the latter lumps together wide and no moat stocks, which are each inherently disparate.

dependent variables. As mentioned previously, however, the relationship between these variables is empirically ambiguous based on the conflict in the economic moat literature. Therefore, it is possible that the regression results will yield unexpected signs.

Moreover, I control for yearly variation over the ten-year sample by treating τ_t as a time fixed effects variable, while θ_i represents my model's company fixed effects variable. In addition, my model has three other control variables: $MarketCap_{it}$, PB_{it}, and PE_{it}. $MarketCap_{ii}$ represents each company's annual market capitalization. PB_{ii} stands for Price/Book ratio, while PE_{it} is Price/Earnings. These two variables were also observed at the yearly level for each company observation; and taken together, these three control variables were included largely because they were incorporated into the regression model used by Liu and Mantecon (2016).[41] Furthermore, though this thesis is focused on moat status' relationship to stock returns, I expect positive signs for each of the three control variables based largely on conclusions reached by Lakonishok et al. (1994) and Fama and French (1995). However, my hypothesis for the magnitude of each of these coefficients is ambiguous because these particular relationships have not been previously analyzed in the literature.

In addition, these independent variables are also included in my additional regressions which assess the relationship between moat status and returns for each of the three sectors included in my dataset, as well as specific industries within those sectors. The three sectors, as mentioned, are consumer defensive, healthcare, and technology. The nine industries are as

[41] Due to data collection constraints, I could not factor in all five control variables used by those authors, though.# This is not a huge concern, however, because I still include three of the components used by Liu and Mantecon (2016), although there is a slight difference with respect to my inclusion of Price/Book ratio, as the aforementioned authors used a slightly different equation: Book-to-Market ratio. Since I did not have access to Book-to-Market ratios over the ten-year period, I used Price/Book ratio as an alternative measure.

follows: alcoholic beverages, biotechnology, drug manufacturers, health care plans, household & personal products, information technology, medical instruments, semiconductors, and software.

Similar to my primary regression measuring whether $Wide_{it}$ is positively related to $Return_{it}$ across all observations included in the dataset, I also expect that for each sector and industry there will be a positive relationship between wide moat stocks and annual returns and a negative relationship between no moat stocks and annual returns. However, I anticipate that the degree to which competitive advantage relates positively to stock performance will differ with respect to certain sectors and industries. As mentioned earlier, I theorize that wide moat status will be easier to maintain for companies in the healthcare sector as opposed to the technology sector, for instance. It is reasonable to infer, therefore, that if a company is more likely to maintain its wide moat rating, it would also be more likely to consistently generate superior stock returns. Thus, I expect the coefficients to be highest for the healthcare regression and lowest for the technology regression.[42]

Additionally, I expect these effects to relate strongly to the industry-specific regressions. In other words, since I expect to see a higher coefficient for the healthcare regression, I also anticipate seeing similar signs for the four healthcare industries under observation.[43] It is worth mentioning, however, that since this sector and industry-specific component of my thesis has been under-studied in the economic moat literature, these particular hypotheses are based largely on my intuition rather than previous theories presented by other authors. Moreover, with respect to no moat stocks, I also expect a negative relationship between No_{it} and $Return_{it}$ for each

[42] I expect the consumer defensive sector, in short, to split the difference.
[43] As shown in Table 13 in the Appendix , these four industries are: Biotechnology, Drug Manufacturers, Health Care Plans, and Medical Instruments.

sector and industry akin to my hypothesis for the no moat dummy variable in my primary regressions. Due to the lack of attention on sector and industry differences in the economic moat literature, though, the magnitude of these negative relationships by sector and industry is ambiguous.

Lastly, my thesis also includes two additional empirical specifications that will add further insight to my research question. First, I created lag variables for each of the three moat dummies as well as my two dependent variables in order to account for the influence moat status in a given year can have on the following year's moat status classification. These five lag variables are: $lagWide_{it}$, $lagNone_{it}$, $lagNarrow_{it}$, $lagReturn_{it}$, and $lagAdjReturn_{it}$. In addition, I will briefly comment in my results section on the interaction between my two primary moat dummy variables ($Wide_{it}$ and No_{it}) and my three control variables ($MarketCap_{it}$, PB_{it}, and PE_{it}). These six additional variables are as follows: $WideMC_{it}$, $WidePB_{it}$, $WidePE_{it}$, $NoMC_{it}$, $NoPB_{it}$, and $NoPE_{it}$. None of the aforementioned economic moat-related studies commented on how moat status may impact these particular control variables. Thus, my expectations for these interaction results are ambiguous.

IV. Data

Nearly all information included in my dataset is from Morningstar. The investment research firm provided all information related to the following variables: economic moat status, sector classifications, average annual share prices, annual stock returns, market capitalization, price-to-book, price-to-cash flow, and price-to-earnings. Economic moat status is often updated on an annual basis by Morningstar, so to assemble moat ratings, I assembled data from the first

analyst report of each year. Other variables collected from Morningstar were taken from each company's respective ten-year summary chart of all relevant financial data. Average annual percentage returns for the market, meanwhile, was taken from the Kenneth French data library. Only one variable -- adjusted return-- was calculated manually by subtracting each company's annual return by the market's overall annual return in order to gage whether a company outperformed the market in a given year.

My collection of firm data spans from January 2008 to December 2017. This time-frame was chosen primarily because Morningstar only provides information for many of the aforementioned variables dating back to 2008.[44] And with respect to economic moat status in particular, Morningstar did not begin to consistently include formal moat classifications until the mid-2000's. However, this ten-year sample period is sufficient enough to test the assumption that firms with sustainable competitive advantages make for better long-term investments, particularly since this dataset comprises multiple business cycles (i.e. the Great Recession and the expansion period following the crisis).

In all, 170 companies across the technology, consumer defensive, and healthcare sectors are included in the dataset, with each one featuring ten annual observations regarding its moat status and stock performance data for that particular year. However, an important note with respect to the size of the dataset is that I was forced to make a number of decisions regarding which companies were included in the final sample. Most notably, a company could not be included if Morningstar did not provide an analyst report because economic moat classifications can only be accessed through Morningstar's archives through these analyst reports. For

[44] Ratios such as P/B and P/E are also only shown over the past ten years on Morningstar, for example.

reference, Morningstar currently provides analyst reports on 1,056 publicly-traded companies, so my dataset was immediately trimmed based on this limitation.[45] Moreover, I also excluded companies that had not been public for at least ten years because investment philosophies that emphasize the importance of competitive advantages stress that wide moat companies are a superior long-term investment rather than a short one. Thus, even wide moat companies that have been public for, say, three years, would not necessarily make for a profitable short-term investment according to this theory.

Summary tables breaking down the distribution of the 1,700 total observations by industry and by moat rating can be found below.

Table 1: Sector Breakdown

Sector	**# of Comp.**	**# of Obs.**	**Percentage**
Consumer Defensive	40	400	23.53%
Healthcare	63	630	37.06%
Technology	67	670	39.41%
Total	**170**	**1,700**	**100%**

[45] This will be discussed further in the paper's section on limitations.

Table 2: Moat Breakdown by Sector

Sector	# of Wide Moat Obs.	# of Narrow Moat Obs.	# of No Moat Obs.	Total
Consumer Defensive	163	169	68	400
Healthcare	228	342	60	630
Technology	167	360	143	670
Total	**558 (32.82%)**	**871 (51.2%)**	**271 (15.9%)**	**1,700**

Table 1 shows the distribution of companies by sector. Table 2, meanwhile, provides additional insight into the moat breakdown by sector. One obvious takeaway is the relative lack of no moat firms in the healthcare sector (10%, as a percentage of total healthcare observations), as well as the relative abundance of healthcare firms with either wide or narrow moats (35% and 55%, respectively). The selection of consumer defensive stocks, however, contain the largest percentage of wide moat observations relative to the other sectors (40.8% as a percentage of total consumer defensive observations), followed by healthcare (36.2%) and technology (24.9%).

Table 3 offers a summary table of the moat dummy and return data, as well as averages for the various control variables. The average yearly unadjusted return among the selected stocks was 16.1%, while the average adjusted return was 5.5%. With respect to the former, these yearly returns ranged from roughly -88% to 311%.

Lastly, Table 4 indicates the variation in moat status categories by year.[46] The narrow moat category comprised the largest segment of the 1,700 observations, although this category also experienced a significant amount of variation over the ten-year sample (-22.92% decline in

[46] Note: time trend tables for each moat dummy category essentially yielded the same results. For instance, a table for WideDummy indicated the same distribution of wide moat observations in the "1" column, while the "0" column was simply the sum of all remaining narrow and no moat observations.

narrow moat observations from 2008-2017). The wide moat category, however, experienced the largest amount of variation, as the 64 observations in 2017 marked a 36.17% increase compared to 2008. The no moat category, meanwhile, was the most stable.

Table 3: Summary Statistics

Variable	**Observations**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
MoatDummy	1,700	.328	.469	0	1
Annual Return (%)	1,700	.161	.375	-.879	3.11
Adjusted Return (%)	1,700	.055	.321	-.989	2.82
Market Cap. ($ millions)	1,700	40,928	68,807	200	906,472
Price/Book	1,700	6.45	28.00	0	850.79
Price/Earnings	1,700	28.58	84.17	0	2464.5

Table 4: Moat Rating by Year

Year	**Wide**	**Narrow**	**None**	Total
2008	47	96	27	1,700
2009	48	96	26	1,700
2010	46	96	28	1,700
2011	51	91	28	1,700
2012	53	86	31	1,700
2013	58	87	25	1,700
2014	62	83	25	1,700
2015	64	82	24	1,700
2016	65	80	25	1,700
2017	64	74	32	1,700
Total	558	871	271	1,700

V. Results

Following the format used by Liu and Mantecon (2016), I will begin by first discussing general takeaways from the stock returns of all 170 companies with respect to moat status, as well as for each fiscal year and sector, before transitioning to my regression results.

Do wide moat stocks make for superior investments? Based on the annual returns from 2008 to 2017 in my dataset, the answer -- surprisingly -- is no. Table 5 presents basic summary results for the average unadjusted and adjusted returns for all 1,700 annual observations according to their moat rating. Stocks with no moats unexpectedly outperformed the wide moat observations by a relatively significant margin, posting higher unadjusted and adjusted returns. In turn, the narrow and no moat stocks also combined to outperform wide moat stocks as well.

Table 5: Unadjusted and Adjusted Returns by Moat (2008-2017)

	Wide	**Narrow**	**None**		**Wide**	**Non-Wide**
Average Annual Return (Unadjusted)	12.97%	16.97%	19.84%		13.45%	17.65%
Average Annual Return (Adjusted)	2.05%	6.78%	9.08%		2.05%	7.20%
Observations	558	871	271		558	1142

Similarly surprising results were also found based on the yearly and sector breakdowns. Table 6 shows that non-wide moat stocks outperformed the wide moat stocks in seven of the ten observation years. And whereas non-wide moat stocks underperformed the broader market on only one occasion (2016), wide moat stocks lagged the market three times (2010, 2013, and 2016). As for how the success of wide moat firms varied by sector, these seemingly

well-positioned companies once again failed to post higher unadjusted and adjusted annual returns than their narrow and no moat counterparts (see Table 7).

Table 6: Adjusted Annual Returns

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Wide	**14.8%**	2.3%	-8.0%	**12.9%**	**1.4%**	-6.0%	4.2%	8.2%	-10.7%	2.1%
Non-Wide	5.5%	**31.7%**	**7.9%**	0.3%	0.9%	**6.0%**	**10.2%**	**8.9%**	**-3.7%**	**3.2%**

Table 7: Returns by Sector (2008 - 2017)

	Wide	**Narrow**	**None**
Technology (Unadjusted)	16.71%	18.58%	23.26%
Technology (Adjusted)	5.80%	8.14%	13.07%
Observations	167	360	143
Consumer Defensive (Unadjusted)	11.38%	14.79%	14.59%
Consumer Defensive (Adjusted)	-0.26%	5.43%	3.38%
Observations	163	169	68
Healthcare (Unadjusted)	11.37%	16.35%	17.63%
Healthecare (Adjusted)	0.72%	6.01%	6.05%
Observations	228	342	60

What stands out the most about these results, however, is how similarly they relate to the results found by Liu and Mantecon (2016). Table 8 indicates this resemblance, as wide moat stocks were also found to be the worst-performing moat category in their eight-year sample period from 2003 to 2011. This was true on both an adjusted and unadjusted basis.[47] In addition, the no moat portfolio also posted the highest average annual returns with unadjusted and adjusted percentage totals north of 20% and 10% respectively. The no moat grouping was also followed by the narrow moat stocks, whose returns were relatively lower compared to my sample, but similarly outperformed wide moat stocks relatively comfortably.

Table 8: Return Comparison

	Manditch (2018)			**Liu and Mantecon (2016)**		
	Wide	Narrow	None	Wide	Narrow	None
Average Annual Return (Unadjusted)	12.97%	16.97%	19.84%	11.2%	14.4%	21.3%
Average Annual Return (Unadjusted)	2.05%	6.78%	9.08%	1.6%	4.8%	11.6%

With these initial results in mind, I will turn now to my regression models.[48] Using robust standard errors to account for heteroskedasticity, $Wide_{it}$ was found to be negatively related to both $Return_{it}$ and $AdjustedReturn_{it}$ relative to the model's narrow moat benchmark variable,

[47] For the record, Liu and Mantecon (2016) used slightly different terminology for these terms, as they referred to unadjusted annual returns as "raw return" and adjusted returns as "market-adjusted returns." However, both sets of terms are interchangeable, as they simply subtracted the benchmark return for the market in a given year by the company-specific return, like I also did.

[48] The results can be found in Table 9.

while No_{it} was found to be positively related to each return variable.[49] The results for the wide moat variable were undoubtedly more noteworthy, though, because each coefficient was statistically significant at the 5% level. In other words, it can be stated with confidence that if a company in my selected sample received an upgrade to wide moat status, its annual return would be expected to decrease by an average of 5.15%. The coefficients for No_{it}, meanwhile, were not statistically significant. Furthermore, all three control variables yielded positive coefficients, with PE_{it} and PB_{it} reporting results that were statistically significant. These results were in accord with my expectations for these signs.

Table 9: Return and Adjusted Return Results

VARIABLES	(1) Return	(2) AdjustedReturn
WideDummy	-0.0511**	-0.0511**
	(0.0254)	(0.0254)
NoDummy	0.0200	0.0200
	(0.0406)	(0.0406)
MarketCap	1.97e-08	1.97e-08
	(2.59e-07)	(2.59e-07)
PB	0.000340*	0.000340*
	(0.000199)	(0.000194)
PE	0.000249***	0.000249**
	(0.000099)	(0.000099)
Constant	-0.298***	0.0857***
	(0.0251)	(0.0251)
Observations	1,700	1,700
R-squared	0.383	0.158

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

[49] Reminder: the model's benchmark variable is the narrow moat dummy since it was naturally omitted from the regression results due to collinearity.

However, the sign of the reported coefficients for $Wide_{it}$ and No_{it} contrasted with both of my hypotheses. But since I previously acknowledged the possibility for unexpected signs based on the empirical findings presented by Liu and Mantecon (2016), it appears my findings simply add more credibility to the aforementioned paper that did not find support for wide moat observations after including companies classified under each of the three moat categories.[50] And whereas Liu and Mantecon did not report a statistically significant coefficient for their wide moat dummy variable, my study found a significant negative relationship at the 5% level. Taken together with the unadjusted and adjusted return results discussed at the beginning of this section, I have once again found little support in favor of wide moat stocks.

Table 10 shows the results for my sector-level regressions. The healthcare moat status variable yielded the most noteworthy result, as $Wide_{it}$ was found to have a relatively large negative relationship with $Return_{it}$ that was statistically significant (p-value = 0.054) relative to the narrow moat benchmark. Combined with how the coefficient for No_{it} was also higher than the result for $Wide_{it}$, these results suggest that wide moat healthcare stocks clearly would not be expected to post higher returns than their non-wide moat counterparts, which is the exact opposite of what I hypothesized. Future research should undoubtedly explore whether there is a particular trend in the healthcare sector that may have driven these results. But based on anecdotal evidence from companies in my dataset, it appears that patents seem to be a key influence. For example, Allergan, a drug manufacturer, experienced 60.20% adjusted growth in 2013 as a non-wide moat firm after acquiring a number of small pharmaceutical companies that each had extended patent licenses on their niche products (Waterhouse, 2013).

[50] Recall that economic moat studies such as Kanuri and McLeod (2016), in contrast, only analyzed the performance of wide moat stocks.

As for the technology and consumer defensive sector regressions, the former did not yield a noteworthy coefficient nor a statistically significant p-value for $Wide_{it}$. This result was not completely unexpected, however, as I theorized that since wide moat status may be more difficult to maintain in a sector where companies must continuously produce innovate products that -- even if successful -- may lose relevance relatively quickly, annual returns with respect to moat status would be the lowest among the three sectors. Though this did not turn out to be true, the coefficient still indicates that possessing a wide moat does not necessarily lead to strong stock performance in the technology sector. Additionally, this argument is supported by the coefficient for No_{it} which -- although not statistically significant -- yielded a high magnitude of 0.088 suggesting that the selected no moat companies in my sample were particularly profitable relative to the narrow moat benchmark. The consumer defensive regression results, meanwhile, were unremarkable: in short, neither the magnitude of the coefficients for $Wide_{it}$ and No_{it} nor the respective p-values were noteworthy with respect to moat status.[51]

[51] It is worth mentioning that the results for the three control variables were similar to the results for these variables in the primary hypotheses. The only exception, however, was that the price/book variable was found to have a small negative relationship with average annual returns in the consumer defensive sector.

Table 10: Sector Regression Results

VARIABLES	(4) Technology Return	(5) Healthcare Return	(6) Consumer Defensive Return
WideDummy	0.00085	-0.0646*	-0.0033
	(0.0465)	(0.0334)	(0.0350)
NoDummy	0.08850	-0.0216	0.0018
	(0.5607)	(0.720)	(0.0669)
MarketCap	6.86e-08	1.14e-07	1.88e-07
	(2.19e-07)	(5.08e-07)	(4.31e-07)
PB	0.0290***	0.000757	-8.89e-06
	(0.00879)	(0.000550)	(0.000877)
PE	0.000108	0.000702	0.001112
	(0.000110)	(0.000516)	(0.000112)
Constant	-0.513***	-0.244***	-0.196***
	(0.0483)	(0.0396)	(0.0396)
Observations	670	630	400
R-squared	0.536	0.383	0.401

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Results for the industry regressions can be found in Tables 14, 15, & 16 in the Appendix. Results for three of the nine industries -- biotechnology, household & personal products, and information technology -- yielded $Wide_{it}$ coefficients that positively related to $Return_{it}$. In fact, the magnitudes for each of the coefficients were noteworthy: the biotechnology regression, for instance, resulted in a coefficient of 0.226, suggesting that an upgrade from non-wide to wide moat status led to a 22.6% increase in returns. The moat status variable for the information technology regression had a similar coefficient (0.212). For household & personal products, meanwhile, while the coefficient was relatively smaller (0.109), the p-value was the closest to being statistically significant (p-value = 0.119), indicating that there is empirical evidence to

nearly say with confidence that wide moat status mattered in this industry over the ten-year sample period.

Six of the other nine industries, in contrast, yielded negative coefficients with respect to $Wide_{it}$. Although none of these results were statistically significant, the magnitudes of a few of these relationships were noteworthy. For instance, two industries within the healthcare sector -- healthcare plans and medical instruments -- reported negative coefficients of -0.119 and -0.140 respectively.

Many other industries delivered noteworthy results for their respective no moat dummy variable as well. While the biotechnology industry reported a coefficient of 0.226 for $Wide_{it}$, this industry's coefficient for No_{it} yielded an even greater positive relationship (0.530) that was statistically significant at the 5% level, suggesting that wide moat biotechnology companies did not necessarily make for a superior investment. A few other industries also reported positive relationships between No_{it} and $Return_{it}$ relative to the narrow moat benchmark: healthcare plans, for instance, yielded a coefficient of 0.166, while semiconductors reported a coefficient of 0.260, each of which were greater than the results for their respective industry's wide moat variable. Furthermore, a few other industries also reported statistically significant results, such as drug manufacturing, alcoholic beverages, and information technology. Given that each of these three No_{it} coefficients were smaller than each industry's respective $Wide_{it}$ result, however, it is reasonable to say that wide moat firms in these industries made for better investments during my selected time-frame.

Lastly, I will briefly discuss the results for my lag and interaction variables, both of which can be found in Tables 17 & 18 in the Appendix. Introducing lag variables in order to

account for autocorrelation, particularly among my model's moat status classifications, did not influence the results. In fact, $lagWide_{it}$ and $lagNo_{it}$ essentially yielded the same coefficients and p-values as my primary regression results in Table 9. The interaction regressions, which attempted to gauge whether moat status had an additional impact on my three control variables, yielded only one statistically significant result, as $NoPB_{it}$ was found to be positively related to $Return_{it}$ at the 1% level, suggesting that a marginal increase in average annual return led to a 6.1% increase in the interaction between no moat stocks and their respective price/book ratios. In addition to not reporting any other significant results for the interaction variables, though, it is worth mentioning that the magnitudes of each of these variables were miniscule, as coefficients for variables such as $WidePB_{it}$ and $WidePE_{it}$ were roughly zero. Furthermore, the coefficients for the two moat status variables were different than the moat dummy coefficients in the my two primary regression models. While a negative coefficient was once again reported for $Wide_{it}$, this value was now statistically significant at the 1% level. No_{it} , meanwhile, yielded a dramatically different result, as the coefficient was found to be negative and statistically significant at the 5% level. Research dedicated to specifically analyzing interactions between moat status and various control variables in more detail would likely add further insight to these relationships and possibly explain why different values were reported for my two moat status dummy variables.

VI. Discussion

Nonetheless, nearly all results discussed in the previous section lead to this conclusion: stocks deemed to have wide economic moats do not necessarily make for superior investments. I rejected my hypothesis that wide moat stocks would outperform non-wide moat stocks based on a variety of information, such as the differences in adjusted and unadjusted annual returns among each moat classification and, most notably, the regression results that did not provide empirical support for my hypothesis. Thus, my findings dispute the conclusions reached by authors such as Kanuri and McLeod (2016) and Boyd (2005), each of whom advocated strongly in favor of wide moat stocks. However, since their studies only looked specifically at whether wide moat firms outperformed the market over their given sample periods, their results are not as convincing as those provided by Liu and Mantecon (2016) due to their exclusion of narrow and no moat stocks from their analysis.

My results, therefore, relate most strongly to the aforementioned paper that also found insubstantial support for wide moat stocks. I will now explain why this was the case. For starters, it is worth mentioning the limitations of my study in terms of how it may have influenced these particular results. As mentioned briefly in Section IV, I was forced to make numerous qualifications with respect to my data. The only way I could collect data on Morningstar's economic moat ratings was to first segment companies through the firm's premium stock screener. While Morningstar currently assigns moat ratings for roughly 17,000 publicly-traded companies, it is impossible to access a company's moat rating history unless Morningstar provides an official analyst report for said company. Due to practical constraints, Morningstar's

analysts only currently cover 1,002 specific companies based largely on investor demand.[52] And since I only observed companies that had been public since 2008 in order to assess the performance of selected companies over as long of a time-frame as possible, while also focusing on companies in three particular industries that fit this criteria, my dataset features both a relatively small sample size as well as a selection bias.

Another limitation is that my study does not account for the possibility of reverse-causality, or endogeneity. This limitation will be discussed further in the following section, but my study could have accounted for this potential issue by conducting an event study that compared differences in actual and predicted returns following a moat status change. Ideally, I would also want annual observations over an even longer time period so as to assess whether the importance of economic moat status has varied across time. But since most of Morningstar's financial data dates back only ten years, this also was not feasible for my study.

As for why I came to my particular conclusions, I will first refer back to the efficient-market hypothesis. Though Fama's theory regarding how it is impossible to consistently generate superior returns relative to the market is debatable, the notion that all relevant and available information is already priced into the market, which therefore decreases the probability of consistently finding profitable investing opportunities, is likely a factor in explaining why moat status was not positively correlated with annual returns. For instance, it is hardly a secret that a wide moat company such as Coca-Cola possesses premier brand and scale advantages. It is also reasonable to infer that wide moat companies are more popular among both institutional and casual investors. Significant awareness of a company like Coca-Cola's advantages, therefore,

[52] More specifically, Morningstar applies a formal research coverage selection method that involves factoring in a company's relevance to client's interests and permanence (i.e. the likelihood a covered company remains relevant for five or more years).

may raise expectations for the stock and, in turn, lower its potential to achieve extraordinary stock growth. This dynamic has even been explored in the literature by the likes of Richardson et al. (2012). The authors found that while investor recognition related positively to stock performance over longer time horizons, stocks in the authors' high-investor-recognition portfolio had lower average annual returns (6.27%) than low-investor-recognition stocks (9.20%) over their selected three-year sample periods.

Another driver of these results is the volatility differences between wide and non-wide moat stocks. Table 11 shows a chart of both the 10 highest and 10 lowest adjusted annual returns among the 1,700 observations. One notable takeaway stands out: there are no wide moat companies listed in either table. In fact, if we were to expand this table to include the top 50 highest adjusted annual return observations, wide moat stocks would comprise only 3 of the 50 data points. No moat stocks, on the other hand, accounted for 6 of the top 7 highest adjusted returns, with companies such as Seagate Technology posting adjusted annual returns over 250%!

In short, wide moat stocks are clearly more stable than non-wide moat stocks, while the latter are more volatile and therefore more likely to earn extremely high returns.[53] Interestingly enough, many of the noteworthy non-wide observations also tended to be rather small. Despite nearly 66% of the dataset featuring large-cap stocks, for example, 12 of the 20 non-wide observations referenced in Table 11 were either mid or small-cap stocks. This observation relates to a discussion topic in Liu and Mantecon (2016) concerning evidence that wide moat firms tend to be large growth stocks, while non-wide moat stocks tend to be small value stocks. Referring back to Lakonishok et al. (1994) and Fama and French (1995), large growth stocks have been

[53] The variance for the adjusted returns of wide moat stocks in my dataset, for the record, was 4.28%. The variance for non-wide moat stocks, in contrast, was 13.18%.

found to post lower returns than small value stocks. It appears that a similar trend could be at play with my results, as a popularity bias could exist that hinders the returns of wide moat firms, while less popular companies deemed by a firm like Morningstar to be a risky investment may be overlooked. Investors, in turn, may miss opportunities to gain stellar returns.

Table 11: Volatility of Adjusted Annual Returns

Highest Observations			Lowest Observations		
Company (Year)	**Adjusted Annual Return (%)**	**Moat Status**	**Company (Year)**	**Adjusted Annual Return (%)**	**Moat Status**
1. Seagate Technology (2009)	282.24%	None	1. Valeant Pharmaceuticals (2016)	-98.94%	Narrow
2. Micron Technology (2009)	264.13%	None	2. Endo International (2016)	-86.32%	None
3. Infineon (2009)	263.81%	None	3. Blackberry (2011)	-76.03%	None
4. Western Digital Corp (2009)	256.54%	None	4. Myriad Genetics (2016)	-74.60%	Narrow
5. Nvidia (2016)	212.10%	Narrow	5. Endo International (2017)	-74.15%	None
6. Micron Technology (2013)	207.91%	None	6. Blackberry (2013)	-72.47%	None
7. Regeneron Pharmaceuticals (2012)	192.61%	None	7. SINA Corp (2014)	-66.95%	Narrow
8. Baidu (2009)	185.90%	Narrow	8. Teva Pharmaceutical (2017)	-66.59%	None
9. Marvell Technology (2009)	182.04%	Narrow	9. Marvell Technology (2012)	-62.29%	Narrow
10. Skyworks Solutions (2015)	156.01%	None	10. Edward Lifesciences (2013)	-62.22%	Narrow

VII. Conclusion

Further research opportunities abound within the economic moat literature. First, future studies should analyze larger datasets. Not only was my study limited with respect to my total number of observations, but even studies such as Kanuri and McLeod (2016) and Boyd (2005) contained fewer than 150 companies in their annual portfolios. Additionally, a continued emphasis on whether moats are more impactful in certain sectors rather than others would be beneficial. This study examined the relationship between competitive advantage and stock performance while specifically looking at companies within three particular sectors. But a future study should include companies from a variety of other sectors, such as financial services and energy. Further interest in industry-specific relationships between moat status and stock returns would complement these sector-related studies as well.

Moreover, future economic moat research should attempt to conduct event-related studies, such as the paper published by Kruger (2015), in order to account for possible endogeneity. Though a method to determine what exactly constitutes as a moat-related event has yet to be accepted in the literature, a news-based study examining how competitive advantage effects short-term stock performance would successfully account for this shortcoming. Additionally, authors have yet to explore how drivers of moat status effect stock performance. In other words, is it more beneficial to possess, say, a superior brand identity or, rather, an unmatched cost advantage? Also, might companies with multiple advantages post even greater stock returns than companies with simply one competitive edge? This type of study could also examine whether specific drivers of sustainable competitive advantage are more desirable in certain industries rather than others.

Nonetheless, my thesis provides an initial assessment of how the performance of stocks based on moat status varies across three sectors and nine industries. And as to the answer of my study's research question, the prevalence of negative and statistically significant coefficients for my wide moat dummy variable, as well as the surprising disparities between the average returns of wide and non-wide moat portfolios over the ten-year sample period, certainly does not provide resounding support for wide moat stocks being vastly superior to other investments. These results even infer that it may be smarter to turn investing attention *away* from companies deemed to have sustainable competitive advantages.

Does this mean that investors such as Buffett are wrong as to the importance of economic moats? No, not exactly. After all, the selected wide moat stocks in my study still narrowly outperformed the market, as seen in Table 5. Wide moat stocks also appear to be far more stable, and thus potentially make for a more desired investment during harsher economic conditions based on how the selected companies in my sample outperformed the market during the three years (2008, 2011, and 2015) in which overall market returns were negative (see Table 6).

It seems, however, that economic moats are more important from a financial perspective (i.e. in terms of whether a company can consistently earn profits) rather than an investment perspective. Aforementioned studies by Porter (1980, 1985), Barney (1991), and Newbert (2008) support this argument. Morningstar, however, seems to lend the impression that all wide moat stocks will make for worthwhile investments. This is not necessarily incorrect, as evidenced by the performance of wide moat companies included in my dataset such as Intuit. The software application firm known for producing software such as TurboTax maintained a wide moat rating throughout all ten years of my study and achieved strong, consistent growth: the company's

share price increased by an average of 11.21% per year. Yet while some other selected wide moat companies performed similarly to Intuit, there were wide moat examples such as AstraZeneca, a drug manufacturer, which also maintained its wide moat status throughout all ten years but only experienced mediocre annual returns relative to the market (5.71% annual growth). Even a famous wide moat company like Coca-Cola performed modestly during this time-frame, growing far below the overall pace of the market at an annual rate of 4.31%.

Thus, investors can come away with plenty of applicable information based on the results of this study. Companies with sustainable competitive advantages surprisingly may not make for a superior stock investment. But by understanding the historical performance of companies based on economic moat status across various sectors and industries, the path toward finding assets that yield extraordinarily high returns will become clearer.

VIII. Appendix

Table 12: Morningstar Moat Rating Process

Source: Morningstar Indexes Yearbook

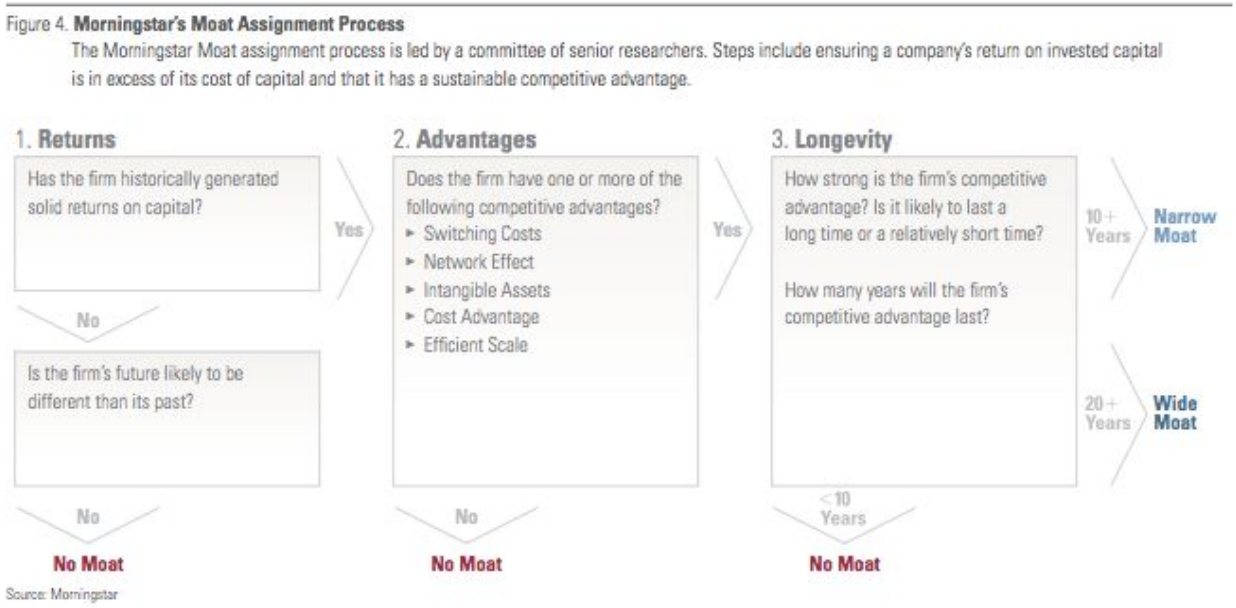

Table 13: Industries Included in Industry-Specific Regression Models

Consumer Defensive	**Healthcare**	**Technology**
Alcoholic Beverages	Biotechnology	Information Technology
Household & Personal Products	Drug Manufacturers	Semiconductors
	Health Care Plans	Software
	Medical Instruments	

Table 14: Industry Results -- Healthcare Sector

VARIABLES	(1) Biotechnology Return	(2) Drug Manufacturers Return	(3) Health Care Plans Return	(4) Medical Instruments Return
WideDummy	0.226	-0.047	-0.119	-0.140
	(0.157)	(0.123)	(0.129)	(0.103)
NoDummy	0.530*	-0.223*	0.166	-0.007
	(0.299)	(0.130)	(0.116)	(0.156)
NarrowDummy	0	0	0	0
	(omitted)	*(omitted)*	*(omitted)*	*(omitted)*
MarketCap	-4.58e-07	1.11e-06	5.73e-07	-2.75e-06
	(1.99e-06)	(9.22e-07)	(1.22e-06)	(7.60e-06)
PB	0.0436***	0.0006	0.0074	0.0058
	(0.01305)	(0.00045)	(0.02702)	(0.0063)
PE	0.0004	0.00001	0.01143**	0.0084***
	(0.00054)	(0.00104)	(0.00458)	(0.0024)
Constant	-0.5114***	-0.1902**	-0.7148***	-0.4225***
	(0.212)	(0.094)	(0.103)	(0.108)
Observations	70	170	70	70
R-squared	0.588	0.444	0.729	0.688

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15: Industry Results -- Consumer Defensive

VARIABLES	(1) Alcoholic Beverages Return	(2) Household & Personal Products Return
WideDummy	-0.020	0.109
	(0.149)	(0.069)
NoDummy	-0.437**	0.037
	(0.194)	(0.093)
NarrowDummy	0	0
	(omitted)	*(omitted)*
MarketCap	-9.99e-06	8.96e-07
	(6.27e-06)	(1.22e-06)
PB	0.0181*	-0.0003*
	(0.0105)	(0.0002)
PE	0.0109**	0.0088***
	(0.0052)	(0.0032)
Constant	-0.3125*	-0.3595***
	(0.159)	(0.088)
Observations	70	70
R-squared	0.578	0.641

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 16: Industry Results -- Technology

VARIABLES	(1) Information Technology Return	(2) Semiconductors Return	(3) Software Return
WideDummy	0.212	-0.064	-0.077
	(0.161)	(0.108)	(0.145)
NoDummy	-0.081**	0.260	-0.136
	(0.107)	(0.169)	(0.124)
NarrowDummy	0	0	0
	(omitted)	*(omitted)*	*(omitted)*
MarketCap	-2.00e-06	1.34e-06	8.76e-07**
	(3.07e-06)	(1.93e-06)	(4.03e-07)
PB	0.1054**	-0.1018*	0.0147**
	(0.0439)	(0.0537)	(0.0063)
PE	0.0012*	0.0011	0.0004
	(0.0007)	(0.0008)	(0.0003)
Constant	-0.8181***	-0.7248***	-0.4005***
	(0.195)	(0.146)	(0.071)
Observations	70	140	180
R-squared	0.734	0.566	0.588

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 17: Lag Regression Results

VARIABLES	(1) Return
lagReturn	0
	(omitted)
lagWideDummy	-0.0511**
	(0.0254)
lagNoDummy	0.0201
	(0.0406)
lagNarrowDummy	0
	(omitted)
MarketCap	1.97e-08
	(2.59e-07)
PB	0.0003*
	(0.001)
PE	0.0002**
	(0.0000)
Constant	-0.2981
	(0.0251)
Observations	1,700
R-squared	0.3834

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 18: Interaction Results

VARIABLES	(1) Return
WideDummy	-0.0794***
	(0.0305)
MarketCap	-2.05e-07
	(3.40e-07)
PB	0.0003
	(0.0002)
PE	0.0002
	(0.0000)
WideMC	3.86e-07
	(2.65e-07)
WidePB	-0.0000
	(0.0004)
WidePE	0.0002
	(0.0002)
Constant	-0.2886
	(0.0252)
Observations	1,700
R-squared	0.384

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

VARIABLES	(1) Return
NoDummy	-0.1905**
	(0.0781)
MarketCap	3.64e-08
	(2.60e-07)
PB	0.0003*
	(0.0001)
PE	0.0002**
	(0.0000)
NoMC	-8.64e-07
	(2.13e-06)
NoPB	0.0619***
	(0.0210)
NoPE	0.0009
	(0.0008)
Constant	-0.3007
	(0.0238)
Observations	1,700
R-squared	0.4009

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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